



Associations of childhood maltreatment with binge eating and binge drinking in emerging adult women

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ARTICLE INFO

Keywords:

Binge Eating
Binge Drinking
Adverse Childhood Experiences (ACEs)
Emerging Adults
Women

ABSTRACT

Background: Binge drinking and binge eating are prevalent, frequently co-occurring, high-risk behaviors among emerging adult women, each with physical and psychological consequences. The mechanisms driving their co-occurrence are not well understood, though a history of adverse childhood experiences (ACEs) may increase the risk for both binge behaviors.

Objective: To assess the association between ACE subtypes and individual and co-occurring binge drinking and eating in emerging adult women.

Participants and Setting: A diverse sample of women participating in the population-based study EAT 2018: Eating and Activity over Time ($N = 788$; aged 18–30; 19% Asian, 22% Black, 19% Latino, and 36% White).

Methods: Multinomial logistic regression estimated associations among ACE subtypes (i.e., sexual abuse, physical abuse, emotional abuse, household dysfunction), and binge drinking, binge eating, and their co-occurrence. Results are reported as predicted probabilities (PP) of each outcome.

Results: Over half of the sample (62%) reported at least one ACE. In models mutually adjusted for other ACEs, physical and emotional abuse showed the strongest associations with binge behaviors. Experiences of physical abuse had the strongest association with a ten-percentage point higher predicted probability of binge drinking (PP = 37%, 95% CI [27–47%]) and seven-percentage point higher PP of co-occurring binge eating and drinking (PP = 12%, 95% CI [5–19%]). Emotional abuse had the strongest association with an 11-percentage point higher PP binge eating only (PP = 20%, 95% CI [11–29%]).

Conclusions: This study found childhood physical and emotional abuse to be particularly relevant risk factors for binge drinking, binge eating, and their co-occurrence among emerging adult women.

1. Background

Emerging adulthood (ages 18 to 25) is a period of several life transitions characterized by increased risk and impulsivity related to addictive health behaviors and is a particularly high-risk period for binge drinking and binge eating in women (Arnett, 2005; Grucza et al., 2018; Qeadan et al., 2023; Sonnevile et al., 2013; Sussman and Arnett, 2014). The term “binge” refers to a pattern of excessive consumptive behavior that occurs in a short, discrete period of time (Escriva-Martinez et al., 2020). Among women, binge drinking (i.e., the consumption of four or more drinks within a two-hour period) (Centers for Disease, 2012; National Institute of Alcohol Abuse and Alcoholism, 2004) is pervasive during emerging

adulthood, with 43% of 18–24-year-old women compared to 55% of men who use alcohol reporting past-year binge drinking (Kanny et al., 2018). Binge eating (i.e., the consumption of an objectively large amount of food in a short period of time, accompanied by a perceived sense of loss of control) is a pattern of disordered eating that is more prevalent among emerging adult women (10%) compared to men (8%) (American Psychiatric, 2016; Benjamin and Wulfert, 2005; Goldschmidt et al., 2014; Guerdjikova et al., 2019; Hudson et al., 2007; Striegel-Moore et al., 2009). Approximately 16–22% of young adult women engage in binge eating behavior (Heatherton et al., 1995; Lynch et al., 2000). In addition to the high prevalence of binge drinking and binge eating on their own, these behaviors also frequently co-occur.

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<https://doi.org/10.1016/j.pmedr.2023.102217>

Received 10 October 2022; Received in revised form 26 March 2023; Accepted 19 April 2023

Available online 22 April 2023

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There is strong evidence of co-morbidity among alcohol use, dependence, and eating disorders, although reviews have found variation in the prevalence rates for both emerging adult and adult women in clinical and community samples (Gadalla and Piran, 2007; Grilo et al., 2002; Holderness et al., 1994). While co-prevalence is higher among clinical samples of emerging and adult women (30–50%), community studies of emerging and adult women report both lower co-prevalence and greater range of co-occurrence (12–39%, median = 26%) (Dansky et al., 2000; Holderness et al., 1994). Meanwhile, one study using a similar community sample to the present study reported the co-occurrence of binge eating and drinking to be 6.2% among women (Simone et al., 2019). While there is variation in the co-prevalence of binge eating and binge drinking, there is consensus that co-occurring binge drinking and eating pose unique health risks, and the comorbidity between both behaviors leads to more negative experiences compared to the presence of only one (Davis et al., 2017; Escrivá-Martínez et al., 2020; Ferriter and Ray, 2011).

The multi-impulsivity model identifies impulsivity as a central trait that develops and maintains binge behaviors like binge eating and binge drinking (Lacey and Evans, 1986). Indeed, binge eating and binge drinking are both characterized by high impulsivity (Fischer et al., 2004; Lee-Winn et al., 2016). They are thought to share common underlying mechanisms reflecting their shared pathophysiology, partly evidenced by their repetitive and uncontrollable nature despite negative health and social consequences (Benjamin and Wulfert, 2005; Ferriter and Ray, 2011; Laghi et al., 2012). These binge behaviors are also characterized by the compulsive use of food or alcohol as a coping mechanism to regulate negative emotions (Ferriter and Ray, 2011; Jackson et al., 2003; Lee et al., 2007), including those resulting from traumatic experiences (Quilliot et al., 2019; Shin et al., 2018), which is often cited as a motivation for substance use. Although several studies on co-occurring binge drinking and eating have identified underlying correlates of these behaviors (Ferriter and Ray, 2011; Holderness et al., 1994), assessed directionality (i.e., does one binge behavior predict the other) (Escriva-Martínez et al., 2020; Franko et al., 2005), and tested associations between childhood adversities and each of these behaviors individually (Coffino et al., 2020; Jung et al., 2020; Loudermilk et al., 2018), limited research has examined associations between Adverse Childhood Experiences (ACEs) and the co-occurrence of binge drinking and eating.

Childhood adversities, such as abuse or neglect and other types of household dysfunction (e.g., parent substance use or domestic violence), are formative psychosocial experiences that may confer risk for a host of behavioral health outcomes (Bellis et al., 2019; Hughes et al., 2017). Results from the 2010 Behavioral Risk Factor Surveillance System indicated that 61% of all adults experienced at least one type of childhood maltreatment or household dysfunction prior to age 18 (CDC, 2020). Women were more likely than men to experience three or more types of maltreatment or household dysfunction, including sexual abuse, intimate partner violence, and parental mental illness (Merrick et al., 2018). Studies indicate a graded relationship of the cumulative number of exposures to maltreatment and household dysfunction with both binge eating and drinking individually (Afifi et al., 2017; Caslini et al., 2016; Dube et al., 2006, 2002; Grigsby et al., 2020; Hazzard et al., 2019; Hughes et al., 2017; Molendijk et al., 2017; Strine et al., 2012; Timko et al., 2008). When examining the association of specific ACEs types with binge drinking, studies have demonstrated stronger associations between childhood sexual abuse (Galaif et al., 2001; Giano et al., 2021; Jasinski et al., 2000; Timko et al., 2008), physical abuse and neglect (Giano et al., 2021; Shin et al., 2009), and verbal or emotional abuse (Fang and McNeil, 2017) compared to household dysfunction (Galaif et al., 2001) or neglect only (Shin et al., 2009). With respect to binge eating, multiple types of childhood maltreatment, neglect, and household dysfunction have also been shown to be associated with binge eating (Afifi et al., 2017), with the strongest association observed with emotional abuse (Caslini et al., 2016; Molendijk et al., 2017) and neglect (Emery et al., 2021). However, limited research has directly addressed

whether childhood maltreatment is associated with the co-occurrence of these binge behaviors. The aim of this study is to examine the associations between adversity subtypes (sexual, physical, and emotional abuse and household dysfunction) and the separate and co-occurrence of binge drinking and eating in a racially and ethnically diverse sample of emerging adult women.

2. Methods

2.1. Study design and population

EAT 2018 (Eating and Activity over Time) is the follow-up of EAT 2010, a population-based study of dietary intake, physical activity, weight control behaviors, weight status, and factors associated with these outcomes in young people. In EAT 2010, 2,793 middle and senior high school students at 20 urban public schools in Minneapolis-St. Paul, Minnesota, completed surveys and anthropometric measures (Larson et al., 2013b; Neumark-Sztainer et al., 2020). The original participants of EAT 2010 were followed up in 2017–2018 with mailed letters inviting them to complete online or paper versions of the EAT 2018 survey. Among the 2,793 participants in the EAT 2010 study, 1,568 (56%) participants responded to the 2018 survey, 58% of whom ($n = 914$) self-identified as women. The analytic sample was restricted to women ($n = 788$) for this cross-sectional study who completed the EAT 2018 survey and retrospectively reported exposure ACEs and prospectively reported drinking and eating behaviors. Due to gendered differences in the prevalence of both ACEs and binge behaviors, as reflected in our data, men were excluded from analysis due to small cell size.

Since attrition in EAT 2018 did not occur completely at random, inverse probability weighting (IPW) was used to account for missing data to minimize potential response bias and to enable the generalization of results back to the original EAT 2010 participants (Little, 1986; Seaman and White, 2013). Weights for IPW were derived as the inverse of the estimated probability that an individual responded at the two time points based on several characteristics reported in 2010, including demographics and key outcomes of the original study (past year frequency of dieting and weight status). After weighting, the 2018 sample distribution by race/ethnicity matched the original 2010 sample; additional methodological and design details are published elsewhere (Larson et al., 2013a; Neumark-Sztainer et al., 2020). All study protocols were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee.

2.2. EAT survey development

The EAT 2018 survey was modified from the EAT 2010 survey to improve the relevance of items for emerging adults. Decisions to retain or drop items were based on the aims of the EAT 2018 survey and the performance of represented constructs in the peer-reviewed literature. Focus groups ($n = 29$) were conducted to pretest the EAT 2018 survey and, after it was finalized, the test-retest reliability of measures was examined using data from a subgroup of 112 young adult participants who completed the EAT 2018 survey twice within a period of three weeks. Development of the surveys were guided by previous Project EAT surveys (Neumark-Sztainer et al., 1999), social cognitive theory (Bandura, 1986; Sallis et al., 2008), experts from various disciplines, and extensive pilot testing.

2.3. Measures

The measures used in these analyses, including the exact wording of questions, cut-points, and coding, are presented in detail in Table 1 and are briefly described below.

Table 1
Description of measures and coding.

Variable	Measure	Responses	Coding	test-retest % agreement (r)
Independent Variables				
Sexual Abuse	Sexual abuse was assessed by two questions: (1) "Did someone in your family touch you in a sexual way against your wishes or force you to touch them in a sexual way?" and (2) "Did someone outside your family touch you in a sexual way against your wishes or force you to touch them in a sexual way? (Do not include events that involved a dating partner)."	1 (yes) or 0 (no)	1 (yes on either question) vs. 0	familial sexual abuse, 95%; non-familial, 90%
Physical Abuse	"An adult in my family hit me so hard it left me with bruises or marks."	4 (very often), 3 (often), 2 (sometimes), 1 (rarely), 0 (never)	4, 3 vs. 2, 1, 0	74%
Emotional Abuse	"An adult in my family said hurtful or insulting things to me."	4 (very often), 3 (often), 2 (sometimes), 1 (rarely), 0 (never)	4, 3 vs. 2, 1, 0	77%
Household Dysfunction	Household dysfunction was assessed by three questions: (1) "Did you live with someone who was a problem drinker or alcoholic, who used street drugs, or who abused prescription drugs?" (2) "Was a household member depressed, mentally ill, or attempted suicide?" and (3) "Did a household member go to prison?"	1 (yes) or 0 (no)	1 (yes on any) vs. 0	81–95%
Household substance abuse	"Did you live with someone who was a problem drinker or alcoholic, who used street drugs, or who abused prescription drugs?"	1 (yes) or 0 (no)	1 (yes on any) vs. 0	87%
Mental illness	"Was a household member depressed, mentally ill, or attempted suicide?"	1 (yes) or 0 (no)	1 (yes on any) vs. 0	81%
Incarcerated family member	"Did a household member go to prison?"	1 (yes) or 0 (no)	1 (yes on any) vs. 0	94%
Dependent Variables				
Binge Drinking	"Think back over the last two weeks. How many times have you had five or more drinks at a sitting? A drink is defined as a bottle of beer, a glass of wine, a wine cooler, a shot glass of liquor, or a mixed drink."	7 (10 or more), 6 (6–9 times), 5 (3–5 times), 4 (twice), 3 (once), 2 (none), 1 (I do not drink alcohol)	7, 6, 5, 4, 3 vs. 2, 1	76%
Binge Eating	"In the past year, have you ever eaten so much food in a short period of time that you would be embarrassed if others saw you (binge eating?)" and "During the times when you ate this way, did you feel you couldn't stop eating or control what or how much you were eating?"	1 (yes) or 0 (no)	1 vs. 0	91%
Covariates				
Ethnicity/race	"Do you think of yourself as (1) White, (2) Black or African American, (3) Hispanic or Latino, (4) Asian American, (5) Native Hawaiian or Pacific Islander, (6) American Indian or Native American, or (7) Other"	categorical	Hawaiian or Pacific Islander and Other collapsed	100%
Socioeconomic status (SES)	Highest level of parental education (1) did not finish high school, (2) finished high school or GED, (3) some college, (4) finished college, (5) master's or doctoral degree, and (6) don't know. Student eligibility for free/reduced price school meals, (yes/no/don't know) and receiving family public assistance (yes/no/don't know). Employment status of parent (full-time/part-time/not working/ don't know).	Categorical [1 (low), 2 (low-medium), 3 (medium), 4 (medium-high), 5 high]		90%

2.4. Independent variables

ACEs. ACEs measures were adapted from the Childhood Trauma Questionnaire (Bernstein et al., 1994) and assessed by asking participants about their own experiences of sexual, physical, or emotional abuse and household dysfunction prior to age 18. The definition of each type of ACE was informed by the Adverse Childhood Experiences Scale (Felitti et al., 1998).

2.5. Dependent variables

Binge drinking. The binge drinking measure was adapted from the Monitoring the Future National Survey (National Institute on Drug Abuse, 2018) and was defined as having five or more drinks at one sitting. A drink was defined as a bottle of beer, a glass of wine, a wine cooler, a shot glass of liquor, or a mixed drink.

Binge eating. Binge eating was defined as eating a large amount of food in a short period of time and feeling unable to control eating. Assessment of binge eating was informed by the Questionnaire on Eating

and Weight Patterns-Revised (Spitzer et al., 1994), Minnesota Adolescent Health Survey (Minnesota Department of Health, 2013), and other Project EAT surveys (Emery et al., 2021; Goldschmidt et al., 2016, 2014; Neumark-Sztainer et al., 2006; Simone et al., 2019).

Binge behaviors. From binge drinking and binge eating, a four-level category was created: (1) no bingeing, (2) binge drinking only, (3) binge eating only, and (4) co-occurring binge drinking and eating.

Covariates. Covariates included age, race/ethnicity, and socioeconomic status (SES) (Neumark-Sztainer et al., 2002; Sherwood et al., 2009), which were self-reported at baseline (EAT 2010). The primary determinant of SES was the highest level of parental education, defined as the higher level of either parent. Other factors included family eligibility for public assistance, free or reduced-cost school meals, and parental employment status. An algorithm was developed to avoid classifying women as high SES based on parental education levels, if they were receiving public assistance, were eligible for public assistance or reduced school meals, or had two unemployed parents (or 1 unemployed parent from a single-parent household). These covariates were selected as sociodemographic factors (e.g., racial identity, ethnicity,

Table 2
Binge behaviors by sociodemographic characteristics of emerging adult women (N = 788).

	Binge behaviors				P value
	No binge (n = 430, 54.5%)	Binge drinking only (n = 223, 28.7%)	Binge eating only (n = 81, 10.4%)	Binge eating and drinking (n = 54, 6.4%)	
Age in years <i>M</i> ± <i>SD</i>	21.8 ± 1.9	22.3 ± 1.9	22.0 ± 1.8	22.0 ± 1.8	0.07
Ethnicity/Race (n, row%)					0.59
White	119 (48.7%)	78 (32.0%)	24 (9.8%)	23 (9.4%)	
Black or African American	107 (58.2%)	53 (28.8%)	17 (9.2%)	7 (3.8%)	
Hispanic or Latino	75 (54.7%)	39 (28.5%)	16 (11.7%)	7 (5.1%)	
Asian American	112 (58.6%)	43 (22.5%)	21 (11.0%)	15 (7.9%)	
Native Hawaiian or Pacific Islander	2 (66.7%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	
American Indian or Native American	9 (52.9%)	4 (23.5%)	3 (17.7%)	1 (5.9%)	
Other/More than one race	6 (50.0%)	5 (41.7%)	0 (0.0%)	1 (8.3%)	
SES (n, row %)					0.89
Low	167 (52.2%)	97 (30.3%)	36 (11.3%)	20 (6.3%)	
Low-Medium	92 (55.8%)	44 (26.7%)	15 (9.1%)	14 (8.5%)	
Medium	77 (59.2%)	31 (23.9%)	15 (11.5%)	7 (5.4%)	
Medium-High	55 (52.4%)	30 (28.6%)	11 (10.5%)	9 (8.6%)	
High					

SES, age) are influenced by structural factors, including racism, known to shape exposure to ACEs, particularly household challenges, and maladaptive coping behaviors, including binge drinking and eating. (Bailey et al., 2017; Franko et al., 2012; Grucza et al., 2018).

3. Statistical analysis

Participant characteristics are presented as mean ± SD or % frequency using t-tests and chi-square tests to assess differences in socio-demographic characteristics by binge behaviors (none, binge eating only, binge drinking only, both binge eating and drinking).

Multinomial logistic regression was used to estimate the association of each childhood adversity type (i.e., sexual abuse, physical abuse, emotional abuse, and sub-types of household dysfunction) with binge drinking only, binge eating only, and co-occurring binge drinking and eating; no reported binge behaviors was the referent. Models were adjusted for age, ethnicity/race, and SES (model 1) and mutually adjusted for other ACEs (model 2). All models were weighted by non-response propensity to reflect the original EAT 2010 sample population (Little, 1986; Seaman and White, 2013). After weighting, there were no significant differences between the baseline and follow-up samples by demographic characteristics. Statistical analyses were conducted using SAS 9.4 (SAS Institute Inc., Cary, NC), and predicted probabilities were derived using the *lsmmeans* function in SAS 9.4.

Results are presented as predicted probabilities (PPs), which emphasize the estimation of the effect of abuse history subtypes on each outcome of interest as opposed to hypothesis testing (Lash, 2017). Predicted probability estimates can be interpreted as the average probability of binge eating, binge drinking, or both binge drinking and binge eating for women who reported specific adversity subtypes (e.g., childhood sexual abuse, childhood household mental illness) after accounting for the influence of covariates. Results of both models, are presented as PPs in Table 3, however, only results from the mutually adjusted model (model 2) will be presented in the results section below as they largely remained consistent with some attenuation. Prevalence of exposure to each ACEs subtype are presented in Table 3. Results from the multinomial models are presented in Supplemental Table 1.

4. Results

4.1. Characteristics of the analytic sample

Approximately 29% (n = 223) of the sample reported binge drinking- only while, 10% (n = 81) reported binge eating only, and 6% (n = 54)

reported engaging in both binge drinking and eating. As shown in Table 2, reported binge behaviors varied by ethnicity/race; white women were most likely to report one or more binge behaviors (51%), followed by Latina women (45%), with Black women being least likely to report any binge behaviors (22%). Across levels of socioeconomic status, the prevalence of binge behaviors ranged from 40.8% (medium-high socioeconomic status) to 47.8% (low socioeconomic status).

4.2. Childhood sexual abuse

Childhood sexual abuse was associated with a one-point higher PP of binge eating than the reference group (PP = 10%, 95% CI [8–20%]). As indicated in Table 3, after mutual adjustment, PPs of binge drinking and co-occurring binge drinking and eating were similar between women with and without childhood sexual abuse histories with largely overlapping confidence intervals. This finding provides limited evidence to support an association between childhood household substance use and binge behaviors independent of other ACEs.

4.3. Childhood physical abuse

Overall, childhood physical abuse was strongly predictive of binge drinking and co-occurring binge drinking and eating. Physical abuse was associated with a 10-percentage point higher PP of binge drinking (PP = 37%, 95% CI [27–47%]) and a seven-percentage point higher PP of co-occurring binge drinking and eating (PP = 12%, 95% CI [5–19%]) compared to the reference group.

4.4. Childhood emotional abuse

Childhood emotional abuse had the strongest association with predicted binge eating only, with an 11-percentage point increase (PP = 20%, 95% CI [11–29%]) compared to the reference group. Childhood emotional abuse was not associated with higher PPs of either binge drinking or co-occurring binge drinking and eating, with the reference group indicating slightly higher PPs of both binge drinking only and co-occurring binge drinking and eating. These mixed results indicate that the association of childhood emotional abuse may reflect correlations of emotional abuse with other ACEs, rather than its own unique associations with binge drinking or binge eating and drinking.

Table 3
Associations between adverse childhood experiences and binge behaviors (N = 788).

Type of ACE*	Model 1			Model 2		
	Binge drinking (n = 223, 28.7%)	Binge eating (n = 81, 10.4%)	Co-occurring binge eating and drinking (n = 54, 6.4%)	Binge drinking (n = 223, 28.7%)	Binge eating (n = 81, 10.4%)	Co-occurring binge eating and drinking (n = 54, 6.4%)
	PP, (95% CI)	PP, (95% CI)	PP, (95% CI)	PP, (95% CI)	PP, (95% CI)	PP, (95% CI)
Sexual abuse (n = 163, 20.7%)						
No (ref)	27% (24, 31%)	9% (7, 12%)	6% (4, 8%)	29% (25, 32%)	9% (7, 12%)	6% (4, 8%)
Yes	30% (23, 38%)	15% (9, 21%) ^a	10% (5, 15%) ^a	27% (19, 35%)	10% (8, 20%)	8% (3, 13%)
Physical abuse (n = 135, 17.6%)						
No (ref)	26% (23, 30%)	10% (8, 12%)	5% (4, 7%)	27% (23, 30%)	10% (8, 13%)	5% (3, 7%)
Yes	36% (27, 44%) ^a	13% (7, 19%) ^a	12% (6, 18%) ^a	37% (27, 47%) ^a	8% (3, 14%)	12% (5, 19%) ^a
Emotional abuse (n = 128, 16.2%)						
No (ref)	28% (24, 32%)	9% (7, 11%)	6% (4, 8%)	29% (25, 33%)	9% (6, 11%)	7% (4, 9%)
Yes	29% (20, 37%)	19% (12, 26%) ^a	7% (3, 12%)	24% (15, 32%)	20% (11, 29%) ^a	5% (1, 8%)
Household substance abuse (n = 177, 22.5%)						
No (ref)	27% (23, 31%)	11% (8, 13%)	6% (4, 8%)	28% (24, 32%)	11% (8, 14%)	6% (4, 8%)
Yes	32% (25, 39%)	11% (6, 15%)	10% (5, 14%) ^a	31% (23, 39%)	7% (3, 11%)	8% (3, 12%)
Mental illness (n = 226, 28.7%)						
No (ref)	27% (23, 31%)	9% (7, 12%)	6% (4, 8%)	27% (23, 31%)	10% (7, 13%)	6% (4, 8%)
Yes	31% (25, 38%)	14% (9, 19%) ^a	9% (5, 13%) ^a	31% (24, 38%)	11% (6, 16%)	7% (3, 11%)
Incarcerated Family (n = 93, 11.8%)						
No (ref)	27% (23, 30%)	10% (8, 13%)	7% (5, 9%)	27% (24, 31%)	10% (8, 13%)	7% (4, 9%)
Yes	38% (28, 49%) ^a	11% (4, 18%)	6% (1, 10%)	37% (26, 48%)	8% (3, 14%)	4% (0, 7%)

Model 1: adjusted for age, race, and socioeconomic status.

Model 2: model 1 + mutually adjusted for other adverse childhood experiences. All models were weighted to reflect the original participants of EAT 2010. a statistically significant difference from reference level at p<0.05

*Ns and percentages reported with respect to each ACE indicate their distribution among the analytical sample.

4.5. Childhood household dysfunction

4.5.1. Childhood household substance abuse

Childhood household substance abuse was weakly associated with a three-percentage point increase in binge drinking only compared to the reference group (PP = 31%, 95% CI [23–39%]). No other positive associations were found among childhood household substance abuse and binge behaviors independent of other ACEs.

4.5.2. Childhood household mental illness

Participants indicating household mental illness in childhood showed consistently higher PPs of all three binge behaviors. Childhood household mental illness was associated with a four-percentage point higher PP of binge drinking (PP = 31%, 95% CI [24–38%]), one-percentage point higher PP of both binge eating (PP = 11%, 95% CI [6–16%]), and co-occurring binge eating and drinking (PP = 7%, 95% CI [3–11%]) compared to the reference group.

4.5.3. Incarcerated family member in childhood

After mutual adjustment, participants who had a family member incarcerated during their childhood indicated a ten percentage-point higher PP of engaging in binge drinking only (PP = 37%, 95% CI [26–48%]) compared to the reference group.

5. Discussion

This study found differences in the patterning of ACEs with respect to binge eating, binge drinking, and the co-occurrence of these behaviors in an ethnically diverse cohort of emerging adult women. After mutual adjustment, childhood emotional abuse was uniquely predictive of binge eating only, and childhood physical abuse had the strongest associations with binge eating, binge drinking, and co-occurring binge drinking and eating, while indicators of childhood household dysfunction (household substance abuse, mental illness, and incarcerated family member) did not have strong independent associations with any binge behaviors. Previous studies have investigated the predictive role of ACEs on binge drinking or binge eating behaviors separately, but not both

binge drinking and eating (Caslini et al., 2016; Hazzard et al., 2019; Jasinski et al., 2000; Shin et al., 2009; Timko et al., 2008). Thus, this study extends the current body of work on these early life predictors of emerging adult binge behaviors.

This study found that childhood physical abuse had strong associations with binge drinking and co-occurring binge eating and drinking behaviors. Indeed, women with a history of childhood physical abuse had a ten-percentage point higher predicted probability of binge drinking and seven-percentage point higher predicted probability of concurrent binge eating and drinking than the reference group. We found that women with a history of childhood emotional abuse had the highest predicted probability of engaging in binge eating only. The point estimates for women with a history of childhood sexual abuse initially suggested an association of sexual abuse with binge eating and concurrent binge eating and drinking; however, these associations were attenuated in the mutually adjusted model. There was also only weak evidence of an association between household substance use and household mental illness and binge behaviors, particularly after mutual adjustment for other ACEs. These findings suggest that exposure to other adversities correlated with subtypes of household dysfunction, rather than exposure to specific household dysfunction adversities themselves, is predictive of binge behaviors (Allem et al., 2015).

Our findings on the association between childhood physical abuse and binge drinking are consistent with previous studies and systematic reviews showing that childhood physical abuse is predictive of heavy episodic drinking in young adulthood (Norman et al., 2012; Shin et al., 2013). There are inconsistencies noted in the literature regarding the association between childhood physical abuse and binge eating, with one systematic review indicating a strong association between physical abuse and eating disorders, specifically bulimia nervosa (Norman et al., 2012). However, findings have been mixed, with another study reporting no clear association between physical abuse and binge eating (Emery et al., 2021). Childhood emotional abuse has also been found to independently predict binge eating (Caslini et al., 2016; Molendijk et al., 2017) and binge drinking (Norman et al., 2012; Shin et al., 2015), respectively. We similarly found a robust association between emotional abuse and binge eating that did not replicate prior research on emotional abuse and binge drinking. One possible explanation for this divergent finding is our focus on women, who have lower rates of binge drinking compared to men (Wilsnack et al., 2018), which may indicate differential coping mechanisms by gender. Another plausible explanation is that our measure of binge drinking captured only those women who consumed five or more drinks in a short amount of time, as opposed to a gender-specific measure that sets the female binge drinking threshold at four or more drinks (Wechsler et al., 1995). This binge drinking threshold may have led to an under-ascertainment of binge drinking and affected estimated associations. These findings on the influence of physical and emotional abuse provide evidence of the possible influence of subtypes of childhood abuse on binge eating and the co-occurrence of binge eating and drinking. Future research should identify the relative influence of childhood adversities on binge behaviors, including the timing and severity of abuse, across larger, geographically diverse populations of emerging adults as well as longitudinally test the efficacy of intervention strategies designed to reduce the incidence of childhood maltreatment and its consequences.

Findings from the current study on the differential associations between childhood adversity subtypes and binge behaviors have important clinical implications. Exposure to childhood abuse appears to be more associated with the risk for binge eating and/or drinking than does the experience of household dysfunction. Emerging adults with a history of childhood abuse, in treatment for eating or substance use disorders, may specifically benefit from trauma-informed approaches that focus on understanding, recognizing, and responding to the effects of trauma (Rosenberg, 2011). Such trauma-informed approaches have been widely implemented in treatment settings focused on mental health and substance use outcomes (Beckett et al., 2017; Roberts et al., 2019;

Rosenberg, 2011). They may be especially effective in targeting the underlying mechanisms of binge behaviors (e.g., difficulties with emotion regulation stemming from trauma exposure) (Quilliot et al., 2019; Shin et al., 2018). In addition to adapting treatment approaches for young adults with a history of childhood abuse, prevention and early intervention efforts are desperately needed to mitigate and potentially eliminate the downstream consequences of childhood abuse on binge behaviors in emerging adulthood.

5.1. Strengths and limitations

This study contributes to the literature by assessing associations between different types of childhood maltreatment and the co-occurrence of binge eating and drinking in a diverse, community-based sample of emerging adult women. This study addresses the limitations of previous research on binge behaviors, which has historically been conducted in populations that predominantly identified as white (Adams et al., 2012; Gadalla and Piran, 2007).

Some limitations must be considered when interpreting our results. First, all variables were obtained through self-report on surveys, which leaves open the possibility of social desirability bias or non-response bias, in which questions were intentionally skipped by study participants. Additionally, this study used a measure of binge drinking that was designed for men, specifically five or more drinks in one sitting, as opposed to the female threshold of four or more drinks in one sitting (Wechsler et al., 1995). Although this approach has been used previously (Simone et al., 2019), our measure of binge drinking among women likely undercounted the true prevalence of binge drinking and, by association, the co-occurrence of binge eating and drinking in our sample. The adapted measures of ACEs did not include neglect, or the timing, frequency, or severity of childhood abuse experiences. Neglect, alone or in combination with other childhood adversities, may be predictive of binge behaviors and may therefore be a confounder of observed associations (Shin et al., 2009). Likewise, the timing, frequency, and severity of childhood ACEs were not ascertained. Limitations regarding the measurement of ACEs represent areas for future investigation. Finally, there was substantial attrition from the sample between the 2010 baseline and 2018 follow-up. If this attrition was associated with both childhood adversity and binge behaviors, there is a risk of selection bias. Statistical methods were used to address differential attrition by baseline characteristics, but we cannot rule out the possibility of residual bias.

6. Conclusion

This study found childhood physical and emotional abuse to be particularly relevant risk factors for binge eating, drinking, and their co-occurrence, among emerging adult women. Our results contribute to research on the effects of childhood adversities on binge eating and drinking by demonstrating that subtypes of abuse have differential effects on the manifestation of binge behaviors separately and together. Although the risk factors for binge behaviors are multifactorial, including formative childhood experiences and social and environmental factors during emerging adulthood, important steps can be taken to strengthen social supports for children and families. Additionally, treatment and prevention strategies targeting binge behavior should screen for co-occurring binge behaviors and consider whether addressing abuse exposures might improve treatment plans and health outcomes in individuals with abuse and adversity histories.

Funding

Data collection for the EAT 2018 study was supported by R01HL127077 and R35HL139853 from the National Heart, Lung, and Blood Institute National Institute. Cynthia Yoon's time was supported by Diabetes and Digestive and Kidney Diseases (T32DK083250, PI: Robert

Jeffery). Rebecca Emery Tavernier's time was supported by the National Center for Advancing Translational Sciences under TL1 R002493 (PI: Fulkerson) and UL1 TR002494 (PI: Blazar).

Jessica Friedman's time was supported in part by the Veterans Health Administration Office of Academic Affiliations Advanced Fellowship in Clinical and Health Services Research (TPH 67-000), and the Minneapolis Center of Innovation, Center for Care Delivery and Outcomes Research (CIN 13- 406)

CRediT authorship contribution statement

J.K. Friedman: Writing – original draft, Writing – review & editing, Visualization. **C. Yoon:** Formal analysis, Writing – review & editing. **R. L. Emery Tavernier:** Writing – review & editing. **S.M. Mason:** Writing – review & editing, Conceptualization, Supervision. **D. Neumark-Sztainer:** Writing – review & editing, Conceptualization, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

This study was supported by R01HL127077 and R35HL139853 from the National Heart, Lung, and Blood Institute (PI: Dianne Neumark-Sztainer).

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States Government.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2023.102217>.

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